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Scientific Areas of Integrated Review Groups (IRGs)

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Integrative, Functional, and Cognitive Neuroscience IRG [IFCN]

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- [Auditory System Study Section \[AUD\]](#)
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- [Neuroendocrinology, Neuroimmunology and Behavior Study Section \[NNB\]](#)
- [Somatosensory and Chemosensory Systems Study Section \[SCS\]](#)
- [Sensorimotor Integration Study Section \[SMI\]](#)

Auditory System Study Section [AUD]

[\[AUD Membership Roster\]](#) [\[AUD Meeting Rosters\]](#)

The Auditory System [AUD] Study Section reviews applications on the structure and function of the auditory and vestibular systems using a variety of approaches. Specific areas covered by AUD:

- Auditory system/hearing: anatomy, physiology, pharmacology, development, maturation, plasticity, disorders, the diagnosis and treatment of auditory disorders, and device assessment using approaches ranging from molecular/cellular to systems/whole organism.
- Vestibular system/end organ: anatomy, physiology, pharmacology, development, maturation, plasticity, and neuro-otological disorders using approaches ranging from molecular/cellular to systems/whole organism.

The study sections with most closely related areas of similar science listed in rank order are:

[Cognitive Neuroscience Study Section \[COG\]](#)

[Sensorimotor Integration Study Section \[SMI\]](#)

[Language and Communication Study Section \[LCOM\]](#)

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Biological Rhythms and Sleep Study Section [BRS]

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The Biological Rhythms and Sleep (BRS) study section reviews applications on the neurobiological basis of biological rhythms including sleep. Proposed studies typically examine molecular, cellular, circuit and system mechanisms responsible for the generation, synchronization, entrainment and modulation of the various rhythms and or their functional role(s). The development, maturation and aging of biological rhythms are considered, as well as plasticity in the adult. BRS primarily considers research with animal models, but relevant work with humans is also included. Specific areas covered by BRS:

- Biological rhythms: neurobiology of circadian and other rhythms in activity, reproduction and sleep-wakefulness, including pacemaker mechanisms and output pathways.
- Sleep neurobiology: neural mechanisms that generate and maintain sleep in animal and human models.
- Synchronized neuronal oscillations involved in CNS function.

The study sections with most closely related areas of similar science listed in rank order are:

[Neuroendocrinology, Neuroimmunology and Behavior Study Section \[NNB\]](#)

[Neurobiology of Motivated Behavior Study Section \[NMB\]](#)

[Neural Basis of Psychopathology, Addictions and Sleep Disorders Study Section \[NPAS\]](#)

[Respiratory Integrative Biology and Translational Research \[RIBT\]](#)

[Biology and Diseases of the Posterior Eye \[BDPE\]](#)

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Cognitive Neuroscience Study Section [COG]

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The Cognitive Neuroscience [COG] Study Section reviews a broad range of applications on the neurobiological mechanisms and principles underlying cognitive functions other than learning and memory. Particular emphasis is placed on studies that directly relate behavioral/cognitive processes to their neural substrates. Multiple approaches and methodologies are appropriate including electrophysiology, anatomy, EEG, fMRI, MEG, psychophysics, behavioral testing, pharmacological intervention and theoretical/computational modeling. Specific areas covered by COG:

- Perception and sensory motor integration: pattern and object recognition in all sensory domains, multi-sensory integration, cross-modal plasticity, decision-making and motor planning.
- Attention: influences of attention on information flow within the brain in human and animal studies.
- Language and speech perception: cortical function in language and speech represented in neural activity.
- Other cognitive functions: executive processes, conscious versus non-conscious processing, imagery, hemispheric specialization, and emotional and motivational processes that influence cognitive function.

The study sections with most closely related areas of similar science listed in rank order are:

[Cognition and Perception Study Section \[CP\]](#)

[Central Visual Processing Study Section \[CVP\]](#)

[Auditory System Study Section \[AUD\]](#)

[Sensorimotor Integration Study Section \[SMI\]](#)

[Language and Communication Study Section \[LCOM\]](#)

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Central Visual Processing Study Section [CVP]

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The Central Visual Processing [CVP] Study Section reviews applications for basic, clinical and applied research investigating normal and impaired visual perception, gaze control and the responsible circuits and structures of the eye and brain. Specific areas include:

- Visual perception of brightness, color, form, motion, depth, patterns and objects as well as visual navigation.
- Movements of the eyes including gaze shifting and accommodation
- Structure, connectivity, and function of cortical and subcortical regions during development, adulthood and aging probed with systems, cellular, and molecular techniques as well as computational models.
- Strabismus, amblyopia, myopia, low vision, disorders of gaze, and enhancing or rehabilitating visual impairments through optical aids or training methods.

The study sections with most closely related areas of similar science listed in rank order are:

[Cognitive Neuroscience Study Section \[COG\]](#)

[Cognition and Perception Study Section \[CP\]](#)

[Sensorimotor Integration Study Section \[SMI\]](#)

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Neurobiology of Learning and Memory Study Section [LAM]

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The Neurobiology of Learning and Memory [LAM] Study Section reviews applications on the neurobiological structures, mechanisms, and principles underlying learning, memory, and associated neural plasticity. The scope of this committee is broad, including studies of the molecular and cellular changes, functional circuitry, and neural coding and integration that underlie learning and memory processes. Most importantly, all studies appropriate for LAM directly relate neural substrates to behavioral/cognitive processes.

- Functional circuitry: anatomical pathways and behavioral physiology of brain structures that mediate learning and memory.
- Neural correlates of learning and memory: neural activity, assessed by single neuron and population firing patterns and imaging, associated with learning and memory.
- Cellular plasticity: understanding cellular events that underlie plasticity related to learning and memory.
- Molecular/genetic approaches: molecular and genetic mechanisms underling specific aspects of learning and memory function.
- Development and aging: neurobiological mechanisms behind development and age-related changes in learning and memory capacity.
- Theoretical modeling: synaptic plasticity, neural circuitry, and interactions among brain structures that affect learning and memory performance.

The study sections with most closely related areas of similar science listed in rank order are:

[Biobehavioral Regulation, Learning and Ethology Study Section \[BRLE\]](#)

[Synapses, Cytoskeleton and Trafficking Study Section \[SYN\]](#)

[Neurotransmitters, Receptors, Channels and Calcium Signaling Study Section \[NTRC\]](#)

[Sensorimotor Integration Study Section \[SMI\]](#)

[Cognitive Neuroscience Study Section \[COG\]](#)

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Neurotoxicology and Alcohol Study Section [NAL]

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The Neurotoxicology and Alcohol [NAL] Study Section addresses the effects of environmental toxicants (such as pesticides or metals) or alcohol on the central nervous system. Specific areas covered by NAL:

- Neuropharmacology/toxicology; neurophysiology: effects of acute or chronic exposure to environmental toxins or alcohol on the central nervous system primarily using animal or in vitro models.
- Behavioral pharmacology/behavioral toxicology: effects of acute or chronic exposure to environmental toxins or alcohol on behavior with a focus on the underlying behavioral and neural mechanisms primarily in animal models. Along with issues of tolerance and dependence for alcohol, this includes craving and initiation and reinforcement of drinking.
- Neuroteratology: effects of acute or chronic prenatal or early exposure to environmental toxins or alcohol on the central nervous system, primarily in animal models.

The study sections with most closely related areas of similar science listed in rank order are:

[Biobehavioral Regulation, Learning and Ethology Study Section \[BRLE\]](#)

[Risk, Prevention and Intervention for Addictions Study Section \[RPIA\]](#)

[Neural Basis of Psychopathology, Addictions and Sleep Disorders Study Section \[NPAS\]](#)

[Child Psychopathology and Developmental Disabilities Study Section \[CPDD\]](#)

Neurobiology of Motivated Behavior Study Section [NMB]

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The Neurobiology of Motivated Behavior [NMB] Study Section reviews applications examining the neuronal circuits critical to the mediation of rewarding and negatively motivated behaviors. Studies reviewed by NMB utilize molecular, cellular, anatomical, and behavioral techniques, however the emphasis of these application is the neurobiological mechanisms underlying the mediation of motivated behavior. Specific Areas covered by NMB:

- Positively motivated behaviors: Includes the mediation of drug and other types of reward; mechanisms of tolerance, dependence, withdrawal, and sensitization, as well as predisposing factors leading to drug seeking and relapse.
- Stress, fear, anxiety, aggression: Examines critical molecules and circuits involved in the mediation of negatively motivated behavior; also, mechanisms of habituation and sensitization leading to altered responsiveness to stressful and aversive stimuli.
- Feeding, drinking, sexual and other consummatory or social behaviors: Limbic and related circuits are investigated to determine their respective roles in the mediation of such behavior; as well as mechanisms of plasticity, and predisposing factors which may shape such behavior.
- Neurobiological actions of psychoactive/psychotherapeutic agents: Includes molecular and cellular mechanisms of action of psychoactive drugs on behavior.

The study sections with most closely related areas of similar science listed in rank order are:

[Neuroendocrinology, Neuroimmunology and Behavior Study Section \[NNB\]](#)
[Biobehavioral Regulation, Learning and Ethology Study Section \[BRLE\]](#)
[Pathophysiological Basis of Mental Disorders and Addictions \[PMDA\]](#)
[Molecular Neuropharmacology and Signaling Study Section \[MNPS\]](#)
[Neurotransporters, Receptors, Channels and Calcium Signaling Study Section \[NTRC\]](#)

Neuroendocrinology, Neuroimmunology and Behavior Study Section [NNB]

[\[NNB Membership Roster\]](#) [\[NNB Meeting Rosters\]](#)

The Neuroendocrinology, Neuroimmunology and Behavior (NNB) study section reviews applications on the neurobiological basis of behavior with a focus on neuroendocrine and neuroimmune systems. Studies typically use behavioral, physiological, pharmacological, anatomical and developmental approaches, but may include cellular, molecular or genetic approaches. The development, maturation and aging of the neuroendocrine and neuroimmune systems are considered, as well as plasticity in the adult. NNB primarily considers research with animal models, but relevant work with humans is also included. Specific areas covered by NNB:

- Reproductive neuroendocrinology: neuroendocrinology of the hypothalamic-pituitary-gonadal axis and associated reproductive behaviors,
- Stress neuroendocrinology: neuroendocrinology of the hypothalamic-pituitary-adrenal axis and associated stress, anxiety and depressive behaviors,
- Affiliative neuroendocrinology: neuroendocrinology of oxytocin, vasopressin and prolactin secretion and associated maternal, affiliative and social behaviors,
- Ingestive behavior: neural regulation of food and fluid intake and whole body energy homeostasis,
- Neuroimmunology: interactions between the nervous and immune systems and associated sickness and depressive behaviors.

The study sections with most closely related areas of similar science listed in rank order are:

[Neurobiology of Motivated Behavior Study Section \[NMB\]](#)
[Integrative Physiology of Obesity and Diabetes Study Section \[IPOD\]](#)
[Biobehavioral Mechanisms of Emotion, Stress and Health Study Section \[MESH\]](#)

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Somatosensory and Chemosensory Systems Study Section [SCS]

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The Somatosensory and Chemosensory Systems [SCS] Study Section reviews research on the anatomy, physiology and psychophysics of chemosensory, pain, analgesia and somatosensory systems in animals and humans. The emphasis is on integrative systems approaches to understanding normal sensory function. Specific areas covered by SCS:

- Chemosensation: olfaction, taste, vomeronasal and trigeminal chemosensory systems studied with approaches ranging from molecular techniques to human psychophysics.
- Pain, itch and analgesia: mediation and modulation of nociception looking at critical circuits [spinal and supraspinal] important in pain sensation.
- Touch, temperature, and vibrotactile sensation: neurobiological aspects of somesthesia.

The study sections with most closely related areas of similar science listed in rank order are:

[Surgery, Anesthesiology, and Trauma \[SAT\]](#)
[Molecular Neuropharmacology and Signaling Study Section \[MNPS\]](#)
[Neurotransporters, Receptors, Channels and Calcium Signaling Study Section \[NTRC\]](#)
[Biophysics of Neural Systems Study Section \[BPNS\]](#)
[Sensorimotor Integration Study Section \[SMI\]](#)

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Sensorimotor Integration Study Section [SMI]

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The Sensorimotor Integration [SMI] Study Section reviews applications concerned with the structure and function of motor, sensorimotor, and vestibular systems, involving neurophysiological, molecular/genetic, biochemical, neuroanatomical, biophysical, behavioral, bioengineering and computational approaches. Emphasis is on integrative systems approaches to elucidating neural substrates of motor control. Specific areas covered by SMI:

- Cortical and cerebellar motor control: anatomy and physiology of cortical and cerebellar microcircuitry involved in voluntary and involuntary movements; reaching and grasping; cortical control of neuroprosthetics; premotor information processing; oral motor control including jaw and tongue movements.
- Spinal and brainstem motor control: anatomy and physiology of spinal circuitry; locomotor mechanisms; motor central pattern generators; respiratory central pattern generators.
- Basal ganglia/subcortical systems motor control: anatomy, biophysics and neurophysiology of basal ganglia neurons and nuclei; subcortical substrates of sequential and learned movements; interactions of basal ganglia and cortical circuits.
- Integration and coordination of sensory and motor signals: invertebrate and vertebrate models of sensorimotor integration including neural mechanisms of active whisking, escape behaviors, proprioception; birdsong vocal motor control and learning.
- Spatial orientation, balance and postural control: vestibular systems anatomy, neurophysiology and behavior; oculomotor control, especially vestibulo-ocular reflex; vestibulo-spinal reflex; neural control and biomechanics of stance in human and animal models.

The study sections with most closely related areas of similar science listed in rank order are:

[Motor Function, Speech and Rehabilitation Study Section \[MFSR\]](#)
[Central Visual Processing Study Section \[CVP\]](#)
[Clinical Neuroplasticity and Neurotransmitters Study Section \[CNNT\]](#)

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